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(54) BUCKLE FOR FLEXIBLE STRAP

(71) We, D.B.S. PRESSINGS LIMITED, a British Company of Grange Works, Beoley Road, Redditch, Worcestershire, do hereby declare the invention for which we pray that a patent may be granted to us, and the method by which it is to be performed to be particularly described in and by the following statement:—

This invention relates to a buckle for securing by friction the opposite end portions of a flexible strap to retain the strap taut when the strap is looped around a package or other object.

The Complete Specification of U.K. Patent 1,305,940 discloses a buckle of the above kind for securing non-metallic strapping such as nylon, or polypropylene and rayon, and comprising a single piece of wire which is bent to form two substantially superimposed and connected U-shaped portions, each strap end portion being gripped between a respective pair of adjacent limbs of the U-shaped portions when the strap is looped around one of the limbs of the pair, which limb constitutes an end portion of the length of wire.

A problem that has arisen in use with such buckles is that under high strap tensions the buckle can become distorted by opening out of the U-shaped portions such that the two limbs formed by the end portions of the wire become outwardly divergent towards their free ends to allow the strap end portions to slip over the wire ends to release the strap.

According to the invention a buckle of the kind set forth comprises two pieces of wire each of which is bent to form from the respective piece a pair of parallel, closely adjacent, substantially straight portions, one of the straight portions of one of the pieces being connected from each of its ends to the corresponding ends of one of the straight portions of the other wire with the connected straight portions spaced apart and substantially parallel so as to form a closed wire loop, and the arrangement being such that when each end of a flexible strap is threaded around a respective pair of the straight portions such that it is passed partially around one straight portion, around the

other straight portion of the pair, between the straight portions of the pair, and back between the threaded strap and said one straight portion, and the strap is then tensioned, the straight portions of each pair are drawn together to grip the strap where it passes between the straight portions of each pair.

The closed wire loop thus formed prevents the buckle from opening apart and releasing the straps in the manner described previously.

Preferably the connections between the connected straight portions are made by further portions of one of the wires which are directly continuous with the respective opposite ends of the connected straight portion and are each there formed with an eye through which said other straight portion passes to complete the connection, a yet further portion of said one wire extending from one of the eyes and being continuous at its other end with the other straight portion of said one wire.

Conveniently the other eye is continuous with a limb which is arranged such that in use its free end forms an abutment which is engaged by the free end portion of said other straight portion of said one wire to prevent said other straight portion becoming deflected towards the other wire.

Preferably the two straight portions of said other wire are connected at opposite ends by respective loops of the wire, one of the loops including an abutment between end portions of the wire.

Preferably said other wire is capable of pivotal movement about the axis of the eyes of said one wire, and the arrangement is such that on tensioning of the strap one of said loops of said other wire engages with said yet further portion of said one wire to urge the straight portions of said one wire together to increase the gripping force on the strap where it passes between the straight portions of said one wire.

A preferred buckle in accordance with the invention will now be described with refer-

ence to the accompanying drawings, in which:—

Figure 1 is a side elevation of the buckle;

Figure 2 is a plan view of the buckle looking in the direction of the arrow A in Figure 1;

Figure 3 is an underplan view of the buckle looking in the direction of the arrow B in Figure 1; and

Figure 4 is a side elevation of the buckle in use clamping the opposite end portions of a flexible tape extending around a package, not shown.

The buckle comprises first and second pieces of wire 1 and 2 respectively. The first wire 1 is bent to define two closely adjacent, parallel, straight portions 3 and 4, and the second wire is bent to define two closely adjacent, parallel, straight portions 5 and 6 which extend parallel to the straight portions 3 and 4. The straight portion 5 is connected at its opposite ends to the corresponding opposite ends of the straight portion 4 by further portions 6 of the first wire which extend directly from opposite ends of the straight portion 4 and connect directly with the straight portion 5 by eyes 7 and 8. Thus the straight portions 4 and 5 together with the further portions 6 constitute a closed wire loop which is more capable of resisting strap forces than is an open U-shape.

The eye 7 is connected to the straight portion 3 of the first wire 1 by a yet further portion 9 of that wire which is superimposed upon one of the further portions 6.

The other eye 8 is continuous with a straight limb 10 of which the free end 11 forms an abutment preventing movement of the free end of the straight portion 3 of the first wire 1 towards the second wire 2.

Straight portions 5 and 6 are connected by loops 12 and 13, the loop 13 including an abutment between the opposite ends of the second wire 2. In use tension in the strap end portion which is gripped by the straight portions 5 and 6 forces the loops 12 and 13 into firm engagement with the portion 9 and limb 10 of the wire 1, with the effects that the force between the straight portions 3 and 4 is increased and that the limb 10 is held firmly against the adjacent further portion 6.

In use a strap is passed around a package and, with reference to Figure 1 and Figure 4, the left hand end of the strap is passed behind portion 5, through the central opening of the buckle, in front of portion 6, back between portions 5 and 6 and then around the back of portion 5 but between portion 5 and the previously threaded strap. The right hand end of the strap is similarly passed around the back portion 4, forwards through the central opening of the buckle, around the front of portion 3, back between portions 3 and 4, and back around the rear of portion 4 but between portion 4 and the previously

threaded strap. The free ends of the strap are then pulled outwards from the buckle to tension the strap with the result that the portions 5 and 6 are drawn together to grip the left hand end portion of the strap where it passes between them, and the portions 3 and 4 similarly grip the right hand end portion between them. The end portions of the strap where they pass around the portions 4 and 5 respectively are also frictionally held against those portions by the tension in the main part of the strap.

WHAT WE CLAIM IS:—

1. A buckle of the kind set forth comprising two pieces of wire each of which is bent to form from the respective piece a pair of parallel closely adjacent, substantially straight portions; one of the straight portions of one of the pieces being connected from each of its ends to the corresponding ends of one of the straight portions of the other wire with the connected straight portions spaced apart and substantially parallel so as to form a closed wire loop, and the arrangement being such that when each end of a flexible strap is threaded around a respective pair of straight portions such that it is passed partially around one straight portion, around the other straight portion of the pair, between the straight portions of the pair, and back between the threaded strap and said one straight portion, and the strap is then tensioned, the straight portions of each pair are drawn together to grip the strap where it passes between the straight portions of each pair.

2. A buckle as claimed in Claim 1 in which the connections between the connected straight portions are made by further portions of one of the wires which are directly continuous with the respective opposite ends of the connected straight portion and are each there formed with an eye through which said other straight portion passes to complete the connection, a yet further portion of said one wire extending from one of the eyes and being continuous at its other end with the other straight portion of said one wire.

3. A buckle as claimed in Claim 2, in which the other eye is continuous with a limb which is arranged such that in use its free end forms an abutment which is engaged by the free end portion of said other straight portion of said one wire to prevent said other straight portion becoming deflected towards the other wire.

4. A buckle as claimed in any of the preceding claims in which the two straight portions of said other wire are connected at opposite ends by respective loops of the wire, one of the loops including an abutment between end portions of the wire.

5. A buckle as claimed in Claim 4 in which said other wire is capable of pivotal move-

5 ment about the axis of the eyes of said one wire, and the arrangement is such that on tensioning of the strap one of said loops of said other wire engages with said yet further portion of said one wire to urge the straight portions of said one wire together to increase the gripping force on the strap where it passes between the straight portions of said one wire.

6. A buckle substantially as described with 10 reference to the accompanying drawings.

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1 SHEET

COMPLETE SPECIFICATION

*This drawing is a reproduction of
the Original on a reduced scale*

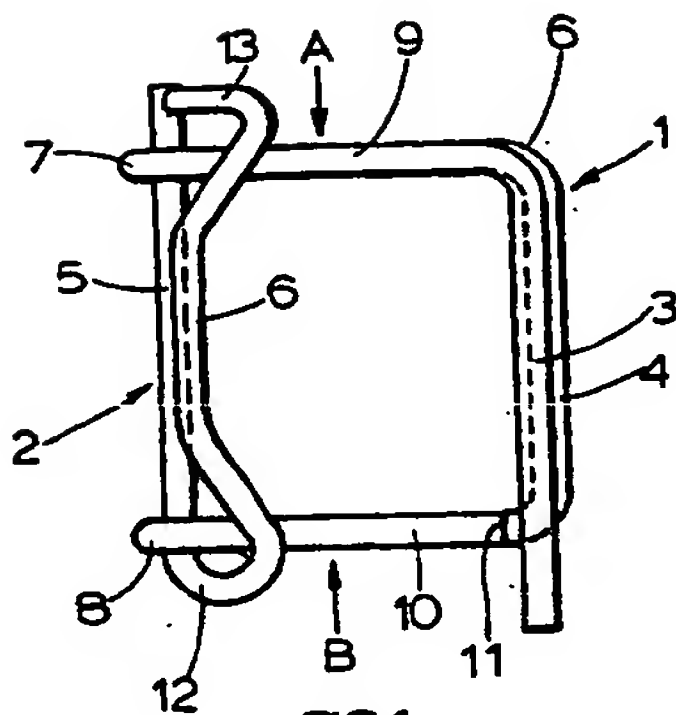


FIG. 1

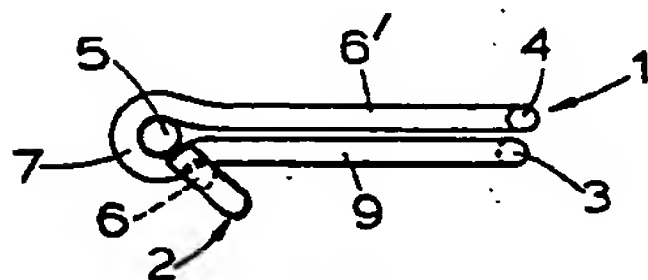


FIG. 2

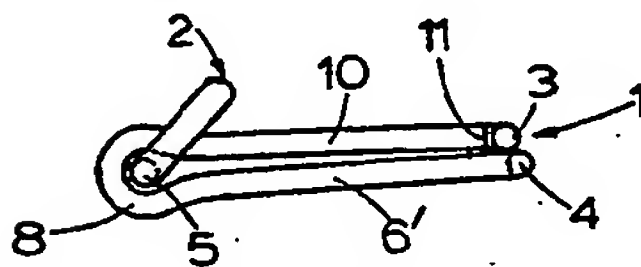


FIG. 3

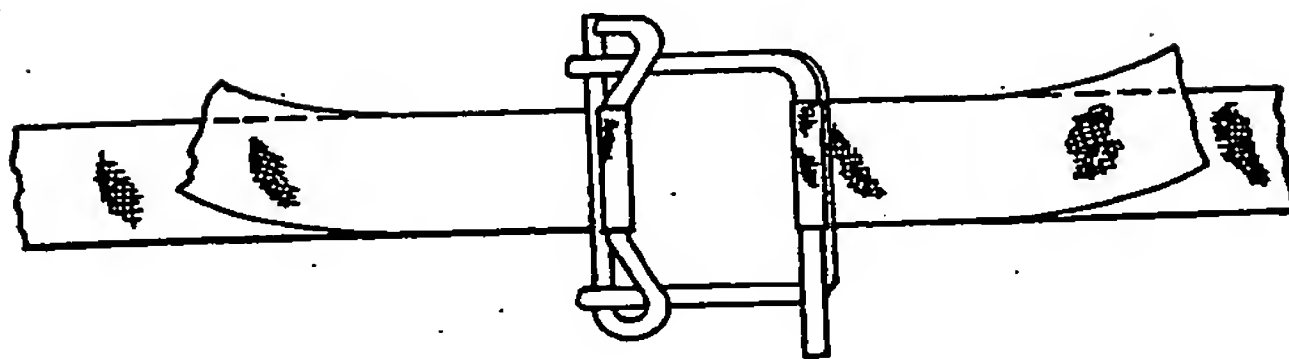


FIG. 4